

L. E. Gads  
Dean of Engineering

# THE FOLIO

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## THE COMPUTING CENTRE

By Dr. D.B. Scott

Editor's note: The following is Part I of a 2 part article by Dr. Scott on the Computing Centre. Part II, which will appear January 16, will deal with the future implications of the computer at the University.

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In 1957 the University of Alberta decided to acquire a digital computing facility of some sort. A suitable committee was charged with the responsibility of making a selection from what was then available and, in September of that year, we proudly took delivery of a Royal McBee LGP 30. This piece of hardware, no bigger than an office desk was, we thought, a high-speed computer. It could multiply two numbers together in about 25 milliseconds and that would make it the equivalent, roughly speaking, of 500 operators with electric desk calculators. The approximation in this remark is unfair to the computer because it is essentially error-free and human operators are not. Indeed, one university department very quickly discovered that the numerical calculations of a number of graduate students, made over several years, was highly inaccurate when the same calculations were re-run on the LGP 30 in a matter of hours.

It is interesting to recall that, in 1957, there were three universities in Canada with computing facilities. UBC beat us by six months (March, 1957) but Toronto had been going since 1948. Now,



"Did it really say, 'Cogito ergo sum,'" asks Dr. D. B. Scott (left), Head of the Department of Computing Science, of Mr. Al Heyworth, Manager of the Computing Centre.

eight years later, there are 32 - up by a factor of 10. In the United States there were already 39 universities and colleges with computing facilities in 1957 and 11 of that number started that year. Now, in the U.S., there are at least 500 - up by more than a factor of 10 in eight years. That number, though, is changing so rapidly, that it is not accurate to associate a single value with any one year.

With as rapid a calculator as an LGP 30 it was not long before several university departments discovered two things: that the calculations associated with much of their research work could be done reliably and with great speed; and that research which was previously unthinkable because of the man-years of calculation involved could now be done. An important restriction on the kind of research that one could do was immediately removed. When the rate of a process increases by an order of magnitude (factor of 10) the process itself changes qualitatively.

When these discoveries were made, the use of our LGP 30 increased until it was going round the clock seven days per week. Some time before this occurred we could see it coming and plans were made to obtain new equipment. In 1961, after some three and a half years of using the LGP 30, we obtained an IBM 1620 with an increase in speed of 20 times. But within one year we were again planning for still faster equipment. After three and a half years of the 1620, with the last year at round-the-clock use, we installed an IBM 7040 in September 1964. The increase in speed over the 1620 was 60 times. We still have this equipment but for some time it has already been on round-the-clock use. This is quite astonishing when one takes the time to think about it. Using, as a crude measuring unit, an operator with an electric desk calculator, we have come from 500 with the LGP 30 through 10,000 with the IBM 1620 to 600,000 with our present IBM 7040. During this quite fantastic rise in compute power there has been a correspondingly fantastic drop in the cost per unit of computing operation as shown in Table 1.

Table 1: Comparison of Three Computers

	Monthly Rental	Speed	Unit Cost
	\$	Equivalent desk calculators	Arbitrary units
LGP 30	1,500	500	300
1620	3,600	10,000	36
7040	12,000	600,000	2

One may well ask - what do we do with all this compute power? Table 2 shows how the research use of the Computing Centre is spread throughout the University.

. . . continued on next page

# THE COMPUTING CENTRE (continued from page one)

Table 2: Users of Computing Facilities for Research

Faculty	Number of Departments Using Computing Facilities
Agriculture	5
Arts	4
Business Administration & Commerce	*
Dentistry	*
Education	6
Engineering	5
Medicine	7
Physical Education	*
Science	9

This makes a total of 36 departments plus three faculties, marked \*, which we have not resolved into departments. There is additional use, not in all cases strictly for research, by the Department of Extension, the University Hospital, the Registrar's Office, Student Counselling Services, and Student Health Services. Finally, the Research Council of Alberta has a small IBM 1620 in its own building which is an extension of the Computing Centre facilities.

The research enterprises among these users have come to depend heavily on computing facilities which have, in fact, irreversibly changed the nature of a substantial fraction of their research work. Indeed the existence of a first class computing centre is now a significant factor in the competition for new staff.



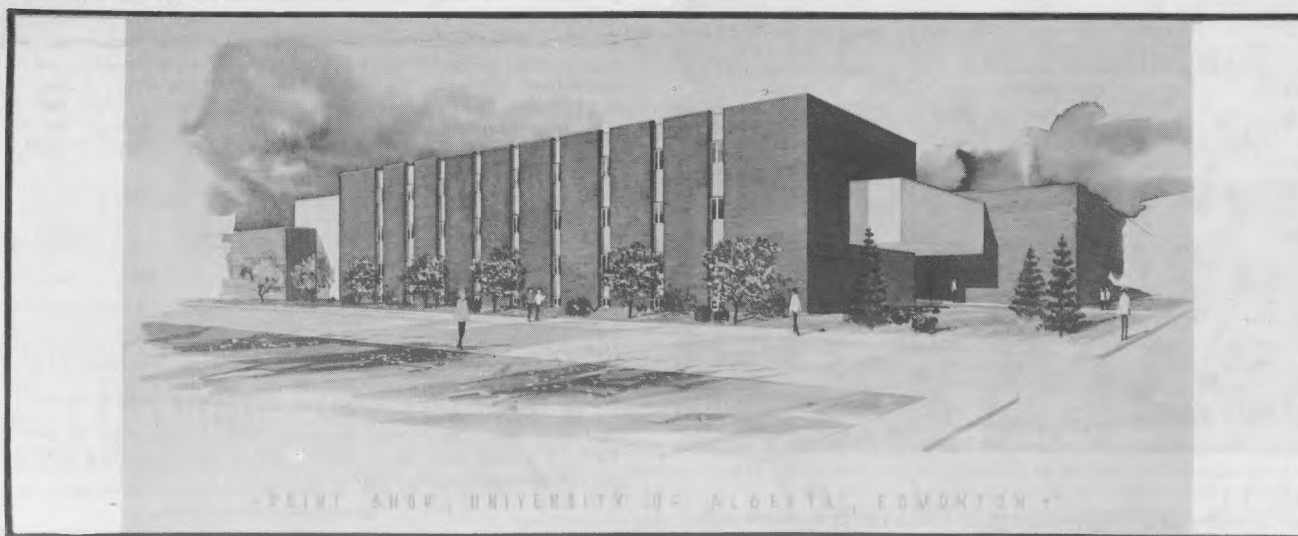
Operator Don Greenleese at the IBM 7040 console.

## Print Shop Building for Aug. '66

Plans for a Print Shop Building on campus have been approved by the Board of Governors, subject to the final approval of the Provincial Government's Capital Development Committee.

The four-storey, red-brick building will be located north of 89th Ave. on 116 Street set back 40 feet from the curb. The gross area of the building will be approximately 54,000 square feet. The University Print Shop will be located in the basement. The first floor will provide urgently required space for Duplicating Services, Technical Services, Campus Patrol and the Superintendent of Buildings. The 3rd and 4th floors will be used as temporary teaching laboratories, accommodating nearly 3,000 students taking first year chemistry and biological sciences. These 2 floors will relieve to a great extent the very desperate science laboratory situation for the next three years.

The Director of Campus Development, MR. J. R. B. JONES, expects that, following the Capital Development Committee's approval, tenders for the building will be let during January with construction to begin in February and completion slated for August, 1966. The Building has been designed by the Alberta Department of Public Works.



## Royal Alex. agreement signed



Dr. C. M. Macleod, Chairman of the University's Board of Governors, and Mrs. Ethel Wilson, Chairman of the Royal Alexandra Hospital Board, sign the official agreement.

An agreement was signed November 29th between the University of Alberta and the Royal Alexandra Hospital formalizing the working relationship between the two and allowing for the development of certain clinical facilities within that hospital to supplement those presently existing or proposed for the University Hospital.

For many years the Royal Alexandra Hospital has been associated with the Faculty of Medicine and the medical staff of the Hospital has played an active and important part in the medical undergraduate and graduate clinical programs of the Faculty. Many of the members of the medical staff of the Hospital have part-time appointments in the Medical Faculty and the Hospital has provided limited facilities for clinical instruction. The increased emphasis on clinical experience for both medical undergraduates and graduate students and the expanding numbers of students involved, made it desirable to formalize a working relationship.

The development of clinical facilities at the Royal Alexandra Hospital will initially be in the field of Obstetrics and Gynaecology and will take the form of expanded outpatient and related facilities. They will enable the Faculty of Medicine to make full use of the Obstetrical-Gynaecological service at the Royal Alexandra Hospital for educational purposes. This Hospital now provides the largest Obstetrical service in Canada but it is not, at the present time, fully organized or developed for providing an educational experience for Medical students.

## Ecuadorian books presented

A gift of 29 volumes on Ecuador has been presented to the University on behalf of the Government of Ecuador. Mrs. Francisca Aguirre-Morrison, Consul of Ecuador in Vancouver, presented the books at a small ceremony in the University Library November 29.

The collection of books was recently published by the Government of Ecuador under the name "Biblioteca Mínima Ecuatoriana." The collection is a condensed but valuable expression of the Ecuadorian character and culture through the main works of outstanding writers, poets, historians, and sociologists of the past and present.

The University of Alberta was selected to receive the collection in recognition of the studies being carried out on the Edmonton campus in the Spanish language and Latin American problems.

President Walter H. Johns (far left) accepts the books, on behalf of the University from Mrs. Morrison. Librarian Bruce Peel and Dr. E. J. H. Greene, Head of the Department of Romance Languages, look on.





## Sod broken for S.U.B.



Sod-turning ceremonies for the largest Students' Union Building in Canada to cost \$6 million were held December 2 at the site west of the Administration Building. Pictured above, spade in hand, is S. U. B. Planning Commission Chairman ANDY BROOK who is also the 1966 Rhodes Scholar. On hand for the ceremony were Provincial Treasurer, A. O. AALBORG; Education Minister, RANDOLPH McKINNON; University President WALTER H. JOHNS; Students' Union President RICHARD PRICE; former S. U. B. Planning Commission Chairman, IAIN MacDONALD; and other Students and university officials.

The building, expected to be completed by the summer of 1967, will include a 750 seat theatre, a new bookstore, an art gallery, curling and bowling facilities, a 750 seat cafeteria, a 500 seat snack bar, a ballroom, lounges, and offices. Students will pay for 65% of the building over the next 31 years with the University carrying the remaining cost for the services it will operate in the building.

The Students' Union has appointed MR. DAVID COOPER, former C. U. S. Comptroller, as Building Manager of the new structure. When the building opens, Mr. Cooper will have special responsibility for scheduling of events and the operations in the recreational and cultural areas. Meanwhile he will be planning for future staff and systems requirements and helping out with current Students' Union projects as needs develop.

## Degree Nursing now 4 years

The University degree program in Nursing is to be reduced from a five to a four year program beginning in September, 1966. The new four year program leading to the degree B.Sc. in Nursing will be more in line with the programs offered at the Universities of McGill, Toronto, B. C., New Brunswick, and Manitoba and will be in accord with a recommendation of the Royal Commission on Health Services that "all University Schools of Nursing develop an integrated degree program and direct all phases of this program."

The new degree program will come under the direct control of the University rather than the former arrangement where the University Hospital gave part of the program. The University Hospital will, however, continue to offer the diploma program for Registered Nurses.

Two three-month summer periods will be required for degree students, following the second and third years. According to the University's Director of Nursing, MISS RUTH E. McCLURE, the School is investigating the possibility of providing a subsidy for the students to cover such expenses as room and board during these two summer periods. She stated that the program will be more academic due to the complete University control and will be more in keeping with other professional programs offered at the University.

Until 1969-70, at which time students in the current five year program will have completed requirements, enrolment in the four year program will be limited to 20 - 25 students each year.

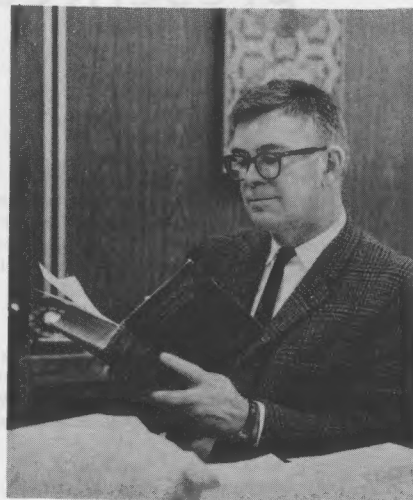
## "better late than never"

Do you have a conscience about overdue books? Mrs. J. W. R. Seattle, of the Vancouver Public Library, has had a University of Alberta book on her conscience for 37 years. Had the library fine system been in effect during this period, she would owe \$2,694 on the book. (Of course, in fact, the library has a 42-day or \$8.40 limit on overdue books, plus the cost of the book.)

The book, "Playmaking - A Manual of Craftsmanship" by William Archer, was taken out in 1928 by J. Campbell Benson, who was then in his second year at the University. It was returned this month to Librarian BRUCE PEEL by Mr. Benson's sister, Mrs. Seattle. In a letter to Mr. Peel, she explained that her brother was interested

in entertaining people and, during the summer of 1928, took a job with the Chautauqua. This was a popular touring group which presented a high-class variety show and educational lectures in small towns throughout the Province during the 1920's. Mr. Benson found Archer's book a useful guide for these shows. During their visit to the Peace River area that year, however, Mr. Benson contracted typhoid fever and died shortly thereafter.

Following a 37-year leave of absence in the Vancouver Public Library, the book has returned to its rightful home and, following a brief stay in the cataloguing department, is soon to appear on the Cameron Library shelves.



Mr. Peel appears amused at the return of the truant book.

# Faculty Notes

## education

A man whose life has been associated with service to others has died. DR. G. FRED McNALLY, teacher, school inspector, normal school principal, curriculum developer, deputy education minister, and university chancellor, passed away December 4th after a short illness. He was 87.



G. F. McNALLY

Dr. McNally had a long association with the University of Alberta. He received from it, in the first Convocation in 1911, the M. A. degree, in 1946 the Honorary Doctor of Laws degree, and in 1958 the first Alumni Golden Jubilee Award. For many years he served as a member of both the Senate and the Board of Governors and from 1946 - 52 held the position of Chancellor.

A citation for Dr. McNally appears in the book "G. Fred" recorded by DEAN H. T. COUTTS and DR. B. E. WALKER. The citation, prepared by Dr. G. V. Haythorne, Deputy Minister of Labour in Ottawa for the opening of the Northern Alberta Institute of Technology in 1963 says, in part, "It is most appropriate that the library in this new Institute be named after G. Fred McNally, whose name, whose spirit, whose inspiration have been connected for so long with education in Canada and particularly in this part of Canada. Dr. McNally, it can be truly said, is one of the great Canadian educators of the 20th century. . . Dr. McNally brings freshness, a vigor, and an enthusiasm to discussions of education. He has also done more than any single other man in Canada today to elevate the status of technical education, which . . . is so essential in today's complex and increasingly technological world."

Dr. McNally will be greatly missed by hundreds of Canadians who knew him well during his full and dedicated life.

## english



HENRY KREISEL published in 1964 by McClelland and Stewart Ltd. and sold the rights for one production to CBC. It was adapted for television by Alvin Goldman.

The first CBC-produced Bob Hope Theatre of the year on December 8 featured a dramatization of DR. HENRY KREISEL'S novel "The Betrayal." Dr. Kreisel, Head of the Department of English, had the novel published in 1964 by McClelland and Stewart Ltd. and sold the rights for one production to CBC. It was adapted for television by Alvin Goldman.

## statistics here

A record number of 430 foreign students plus 200 landed immigrants are registered on campus this year representing 52 nations. According to MAJOR R. C. W. HOOPER, Dean of Men and Foreign Student Advisor, this campus has about the 3rd or 4th largest foreign student community in Canada.

The United States has the largest representation followed by India, Hong Kong, and Uganda. The most popular areas of study on campus for foreign students are, in order, chemistry, education, engineering, psychology, and medicine. Of the 430 foreign students, 268 are in graduate studies, 162 are undergraduates. The men outnumber the women by 346 to 84. There are 10 married couples amongst the foreign students, 8 of which are from the U.S. One hundred twenty-five foreign students live in residence, principally in Pembina and Athabasca Halls.

## ... and there

The Dominion Bureau of Statistics has issued some interesting Canadian University statistics for 1964-65 as compared with those of the previous year (brackets).

Enrolment of full-time students at University level - 178,238 (158,388). Undergraduates - 164,441 (147,255), graduates - 13,797 (11,133). Men - 125,223 (113,625), women - 53,015 (44,763).

The Association of Universities and Colleges of Canada predicts that the total full-time enrolment this year will be about 200,900. The big six universities - Montreal, Toronto, B. C., Laval, Alberta, and McGill - will probably continue to provide the majority of Canadian students. Last year they held 54% of the full-time enrolment at Canadian universities.

Enrolment as a percentage of the college age population 18 to 24 years - 9.2% (8.6%). Men - 12.0% (12.3%), women 5.5% (4.9%).

Enrolment of part-time students in university-level degree or diploma credit courses, winter session - 63,824 (57,043).

Enrolment of foreign students in Canadian universities - 10,600\* (9,490).

Degrees earned - 36,400\* (33,055). First degrees and equivalent diplomas - 31,800\* (29,084), advanced degrees - 4,600\* (3,971).

Number of full-time teachers and research workers - 14,300\* (12,940).

Median salary of full-time teachers and research workers - \$9,450\* (\$8,890).

University expenditures \$562 million\* (\$435 million). Operating, including research - \$345 million\* (\$290 million), capital - \$217 million\* (\$145 million).

\*estimates

## geology



The three interlocking triangles represent industry, academia, and government, all of which were represented at the Conference.

The P.S. Warren Geological Society, a student group in geology, held a highly successful second Western Inter-University Geological Conference on campus November 26 and 27 for representatives from Industry, Government, and the Universities. The Conference was dedicated to DR. PERCIVAL SYDNEY WARREN - Professor Emeritus of this University, Head of the Department of Geology from 1949-55, for many years Chairman of the Men's Athletic Board, Lt. Col. in Command of C. O. T. C. during World War II, Provost from 1945-47, and Fellow of the Royal Society of Canada.

The Conference theme was "Geological Education" which produced lively discussion and outstanding talks, especially from Visiting Lecturer R. W. Fairbridge of Columbia University and Dr. H. H. Beach, Vice-President of Texaco. Graduate student A. A. JOHNSON chaired the Conference. Honorary Chairman was DR. R. E. FOLINSBEE while DRS. C. R. STELCK & R. A. BURWASH acted as faculty advisers.

## agriculture

An Alberta Agricultural Research Trust has been set up by the Alberta Department of Agriculture to assist the University's Faculty of Agriculture to expand its research effort. Half a million dollars has been provided to establish the Trust and a grant of \$100,000 to \$200,000 per year is forthcoming.

The Trust has been established in recognition of the Faculty's efforts as the main provincial research agency working on Alberta agricultural problems. It becomes effective April 1st, 1966. DR. G. F. BENTLEY, Dean of the Faculty, commented that "all citizens will in the long run benefit because, over the years, agricultural research work has improved the quality, uniformity, and healthfulness of foods while the increasing productivity of the industry of agriculture has reduced the percentage of disposable income which families pay for food. These trends will continue and the benefits should become even greater with expanded agricultural research."

He also stated that farmers, industries related to agriculture, and agricultural commodity groups wishing to provide financial support for agricultural research in Alberta will now be able to get much better value from their contributions because the Alberta Department of Agriculture will match such contributions on a dollar for dollar basis if they are made to the Alberta Agricultural Research Trust.

## calendar of events, december 16th to january 15th

Dec. 16 - Handel's "Messiah" performed by the University Singers, the University Bachelor of Music students, and the University Chamber Orchestra, Jubilee Auditorium, 8:15 p.m. No reserved seats, tickets \$2.00.

Studio Theatre presents "John Brown's Body" through to December 18th.

Fine Arts Gallery: An exhibition of drawings and paintings by Bob Sinclair, currently on staff in the Department of Art, will be shown through December 17 from 7 - 9 p.m.

Dec. 17 - T.G.I.F. Night at the Faculty Club: Irish Corned Beef and Cabbage.

Lobster Night at the Faculty Club upstairs, 6 - 9 p.m., \$5.50 per plate.

Dec. 18 - Lectures end at 12 noon, Christmas Vacation begins.

Lobster Night at the Faculty Club from 6 - 9 p.m. at \$5.50 per plate, followed by dancing for all members and their guests.

Dec. 24 - University closed all day through to and including December 27th, for Christmas. Faculty Club closed until December 26th.

Dec. 28 - Basketball: Tennessee A & I State University versus U of A, Main Gym, 8:30 p.m.

Dec. 29 - Basketball: Indiana State University versus U of A, Main Gym, 8:30 p.m.

Dec. 31 - New Year's Eve: University closed all day.

New Year's Eve Party at the Faculty Club: \$20.00 per couple includes hors d'oeuvres and cocktails from 9:30 p.m. to 1:30 a.m., dancing from 10 p.m. to 2 a.m., New Year's handouts, special entertainment from 11 to 11:30 p.m., and an elegant midnight buffet with wine. Please reserve.

Jan. 3 - First term lectures resume.

Jan. 7 - T.G.I.F. at the Faculty Club - Rainbow Trout Sauté Amandine.

Jan. 8 - Last day of lectures in the first term, except in the D. D. S., LL. B., M. D., and Dental Hygiene programs.

Dinner Dance at the Faculty Club.

Jan. 10 - Test Week through to Jan. 15.

Jan. 14 - T.G.I.F. at the Faculty Club - Swiss Cordon Bleu.

Jan. 15 - Dinner Dance at the Faculty Club.

### soviet exchange

The National Research Council has indicated that it is prepared to accept applications for participation in its program of exchanges with the Soviet Academy of Sciences.

The terms of the agreement between the National Research Council and the Soviet Academy of Sciences provides for an annual exchange of "scientific research workers to carry out research work in the scientific establishments of the other country for periods ranging from three weeks to nine months." Applicants should have the equivalent of the Ph. D. degree and should be prepared to undertake a research project in an institute in the U. S. S. R. or, in the case of more senior applicants, to make an intensive survey of work in their own fields in the U. S. S. R. All expenses for visits are provided under the terms of the agreement. It is not essential that applicants be proficient in the Russian language but such knowledge will be useful.

Applications will be accepted until January 21st, 1966, and a decision on Canadian participation will be made by the Council at its meeting in March. Application forms may be obtained from the National Research Council or are available in the Bursar's Office. For further information, correspondence should be addressed to Dr. J. D. Babbitt, Secretary for International Relations, National Research Council, Ottawa.

### fellowships

The Canada Council will award 8 Special Fellowships in Canada within the general fields of engineering, medicine, or science. Candidates must be Canadian citizens at the post-doctoral or equivalent level, preferably between the ages of 25 and 35 years, wishing to do research or study in interdisciplinary areas. The awards, usually given for two years, range from \$6,000 to \$9,000 per year and must be held in Canada. Further details are available from the Deans of Engineering, Medicine, and Science. Applications must reach the President's Office not later than January 15, 1966.

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Four Urban Studies Fellowships are being offered in 1966 by the Canadian Council on Urban and Regional Research to assist candidates who are planning advanced programs of studies related to Canadian urban affairs. The basic value of each Fellowship is \$3,500 for 1966-67 plus a possible supplemental amount of \$3,500 if the Fellow is required to take leave without pay. Application forms are available from The Secretary, Canadian Council on Urban and Regional Research, Ste. 308, 225 Metcalfe, Ottawa 4.

### memos

Interested in sending your friends souvenirs of the Edmonton campus? The Bookstore has on sale: 1966 Desk Calendars with 13 full-colour photographs of the campus for \$1.00 each; Christmas cards, featuring a coloured photograph of the Cameron Library, at 12 for \$1.90; and coloured aerial view postcards of the campus at \$.10 each.

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A workshop on the applications of nuclear magnetic resonance (NMR) spectroscopy will be held December 29 and 30. Anyone in the university whose research interests are related to these studies or who may find the applications of NMR valuable to his work is welcome to attend. Lectures will begin at 9:30 a.m. and 1:30 p.m. both days, in room 126, Math-Physics building. Demonstrations of the use of the Chemistry department's three NMR spectrometers will be held during the evenings. Arrangements for these will be made at the first lecture. For further information, please call J. S. Martin (507) or S. Masamune (802).

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The Folio will not be published during the Christmas recess. The next issue will appear January 16th. Deadline for this issue is January 10th.

## Christmas Greetings and

## Best Wishes for the New Year